BRISBANE VALLEY FLYER

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BRISBANE VALLEY SPORT AVIATION CLUB INC

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The Sneaky Stall – Part 1

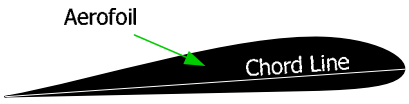
By Rob Knight

Some say that stalls are caused by flying at too low an airspeed. Others claim stalls happen when pilots try to climb too steeply. Yet others are simply so scared by the propaganda put out about stalling and its dangers they cannot overcome their trepidation and become conversant with them. What's the issue here? The actual cause of a stall is simple and should be well known and stalls are predictable. Deliberate stalls are not dangerous. Pilot entered stalls are corrected/recovered from with simplistic ease and in complete safety. BUT….herein lies the qualifying phrase – *deliberately entered stalls*. I cannot ever recall hearing or reading about any serious accident, or even an incident, involving a deliberately entered stall.

But stalls are sneaky. Stalls can appear at any time, at any speed; indeed a major 21st century mystery some would say. Obviously stalls are no fairy-tale so let's take a realistic look at their simplicity and safety.

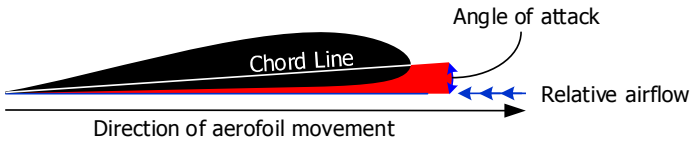
Let's start by dispelling some myths. Stalls really can occur at any airspeed, anywhere from an aeroplane's V_{NE} down to a zero reading on the ASI. Stalls can also be experienced at any nose attitude, from vertical climb to vertical dive and anywhere in between. They can occur when an aeroplane is inverted straight and level right-side-up. So is there any time when an aeroplane is safe from a stall? When can a pilot relax their vigilance? The answer is a resounding YES! An aeroplane is safe from a stall at any point in time when its angle of attack is less than the aerofoil's stalling angle. Generally, aerofoils (airfoils in Trumpland talk) stall at about 15° angle of attack so as long as the aeroplane's angle of attack is less than the 15°limit, the aeroplane simply cannot stall

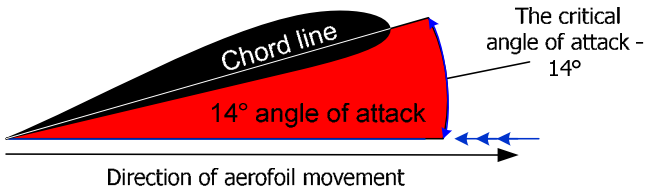
To better understand this we need to look at a couple of definitions. We said that the stall occurred because the angle of attack was too high i.e., greater than 15°. The angle of attack is the angle between the chord line of the aerofoil and the relative airflow (relative wind in more Trumpland talk). So what's an aerofoil? An aerofoil is the cross section of a wing. A cross section that displays the shapes and the curves of the upper and lower surfaces as shown above.



The "chord line" it is a straight line joining the leading edge of an aerofoil as shown on the left

The angle of attack is the angle made between the chord line and the relative airflow as shown on the right. If the angle of the chord line changes, OR the relative airflow changes direction, the angle of attack will change. In the illustration on the right, the angle of attack is about 4°, the angle of attack where the best lift/drag ratio occurs and where the aerofoil is most efficient.



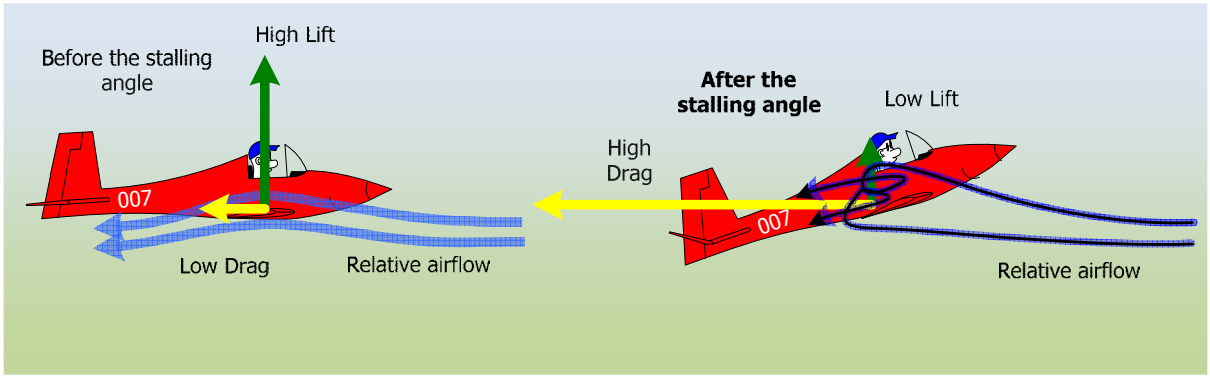


If the aeroplane stalls at 15° angle of attack, then we could call 14° the *critical angle* because, if we increase the angle

any further we will induce the aerofoil to stall.

Now the cause is ascertained, what actually happens when a stall physically occurs? The word stall is usually associated with something that stops and, in this sense, the same applies. However, what has stopped is not the aeroplane, but the smooth flow of air that passes over the upper surface of the aerofoil in normal flight. At the stall, the relatively smooth airflow over the aerofoil breaks away from the surface and tumbles in a series of eddies and swirling currents. As the previously relatively smooth airflow provided about 80% of the lift produced, so, at the stall, we will lose a large proportion of lift.

So why does this air break away is the next obvious question? You are driving on a motorway and proceed around a bend. Doing 100 KPH, the time to drive around the bend is comfortable and there is no adverse effect caused by the vehicle mass to force you away from the curve. But what if you tried to drive around the curve at 200 KPH? It is quite possible that the vehicle will not be able to take the curve and will slide/skid/roll towards the outside of the curve and into the barrier positioned for that very purpose. The cause is that the inertia of the vehicle prevents it following the change in direction around the curve. The air behaves in the same fashion – the inertia of the air precludes it following the change in direction over the upper surface of the aerofoil aft of the point of maximum camber. And the air will behave in exactly the same manner as the vehicle. It, too, will not be able to take the bend and will "spin out", breaking away into turbulent flows and eddies. Here's the simplicity of it – no smooth flow – much less lift and much more drag.

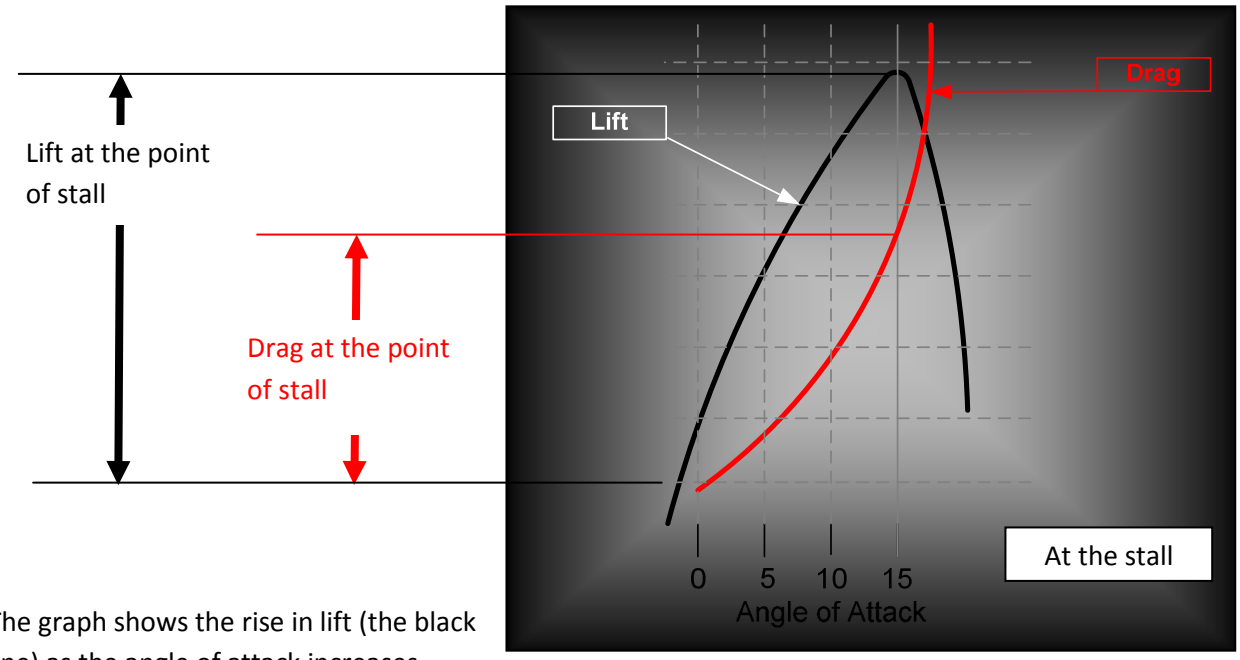


The change in lift and drag is indicated in the above sketch by the green and the yellow lines which clearly illustrate the magnitude of the change in lift and drag values.

The simplicity of the stall can now be easily seen. It is just the breakdown in smooth airflow over the wing to turbulent flow and it's caused by an angle of attack that is too great. Remove the excessive angle of attack and the aeroplane will resume normal flight – it really is as simple as that.

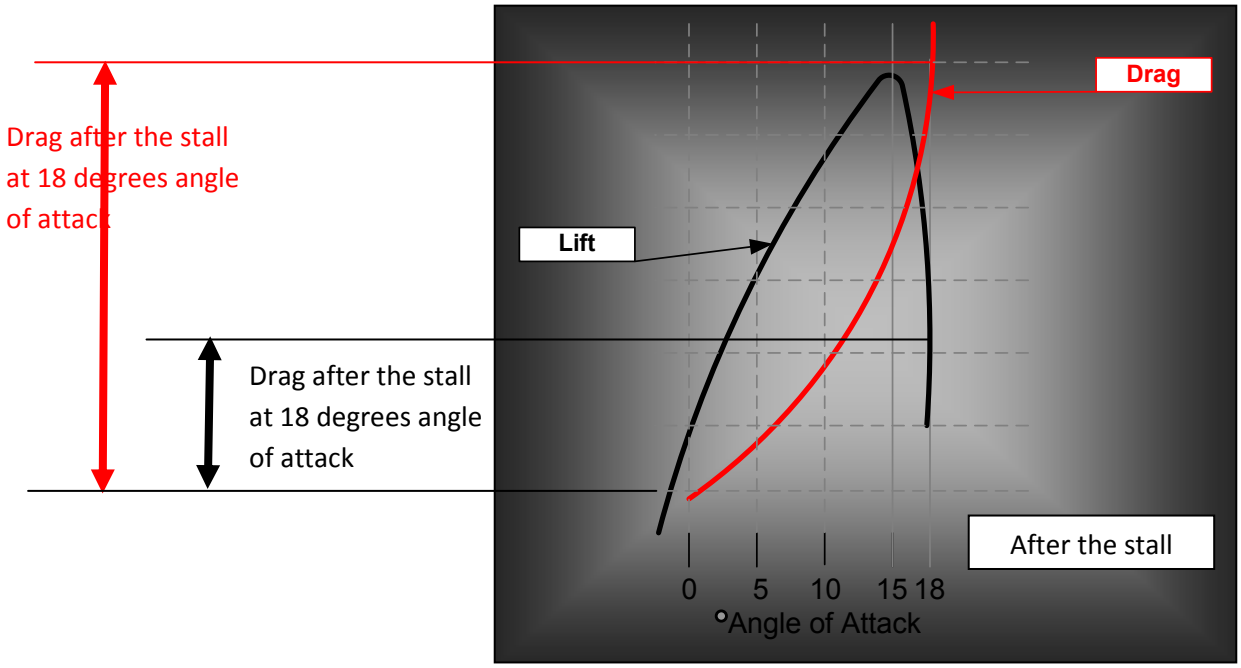
The MOST likely pilot to need to have a good recovery technique is one that will NEVER do a stall because it is too frightening. If they are ever faced with an unexpected stick buffet they will assume that it is just turbulence. They will not instinctively check the stick forward. They have trained themselves that they don't ever stall so it just can't happen. How dangerous is THAT?

Let's put some proportions in this change in lift and drag. Let's look at how the lift and the total drag on the aerofoil change with changing angle of attack. The easiest way to display this is on a graph. The graph displays the value changes in both lift and drag plotted against the angle of attack



The graph shows the rise in lift (the black line) as the angle of attack increases until, at 15°, the stall occurs. Notice how rapidly the lift decreases after the stall angle has been exceeded.

BUT… also notice how quickly the drag (the red line) soars upwards with the increasing angle of attack. At the stall angle its rise is almost exponential.



So what does this mean to a pilot? It means that, if you exceed the stalling angle of attack, the loss of lift may be savage but the rise in drag can be extreme.

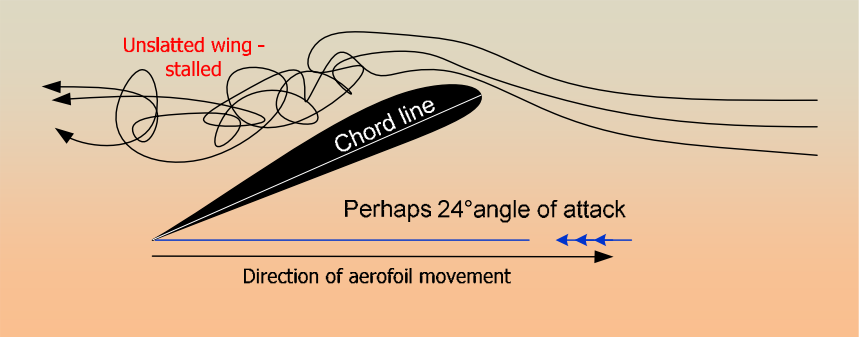
With all this emphasis on the stalling angle, where does the reference to stalling speed come from? That's the term that everyone's talking about. Alas, to consider that an aeroplane stalls at a stated airspeed is something of a misnomer, perhaps even dangerous. The often flight manual quoted stalling speed is the speed the aeroplane reaches the stalling angle of attack in straight and level flight when being flown by a test pilot, with no slip or skid, perhaps with power and all the available high lift devices applied. This is most often quoted as being applicable on approach which, of course, it can't be because it is in level flight where this speed is ascertained. As previously discussed, an aeroplane stalls at an angle of attack so an aeroplane can stall at any speed.

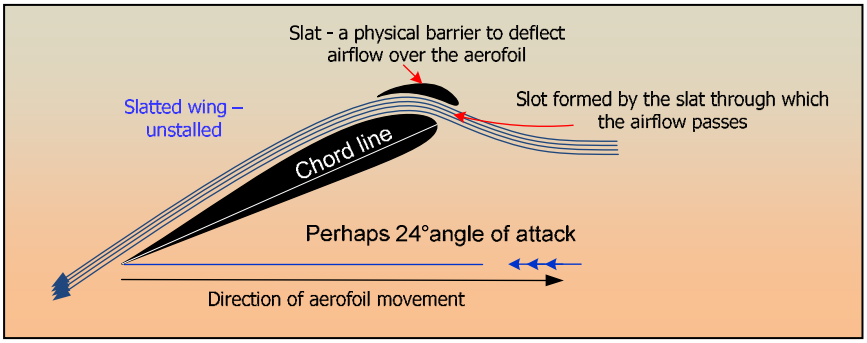
However, using the stall speed as a guide does have one attribute. It allows us to compare the effects of variations that we can make to the aeroplane. For example, if we accept that an aeroplane stalls at 40 knots without flap or power applied, we can then see how effective the use of flap or power is to lift by noting how much slower we can fly before we reach the stalling angle. Thus, if the aeroplanes stalls at 38 knots with flap down, we can accept that we have a lower stall speed when the flaps are lowered. Not that it will always stall at 38 knots now the flaps are down, because it won't, just that we need less speed to fly with flaps lowered so we might have an increased safety margin.

We also talk about the stall speed because we don't have a simple means of measuring or seeing the angle of attack. Without a practical angle of attack indication, we use a rule of thumb system which, if we follow, should mean that we are not about to stall. Alas, the stall/crash statistics clearly indicate there needs to be a better understanding of the whole issue so a better appraisal can be made by pilots instead of feeling happy because their airspeed is above the stall speed. This will only assist SOMETIMES.

Most modern aeroplanes are provided with high lift devices such as slats/slots and flaps. These have the effect of lowering the speed at the stalling angle in level flight.

Earlier I used an analogy of a motorway with a physical metal barrier to stop vehicles leaving the roadway – the safety barrier. Slats are exactly the same thing and provided for the same reason – to force the airflow around the curve of the aerofoil and delay the stall until an angle of attack higher than the aforesaid 15° occurs. Slats can raise the stalling angle of attack to as much as 25°. Note that a slot is the gap between the wing and the slat and that some wings have slots built into them so there is no drag-creating protuberance above the wing to kill cruise speed. Slats are not a new invention. They were fitted by de





Havillands to Tiger Moths in the 1930s and to airliners ever since them. Storch make great use of them to aid their STOL capabilities, and Cessna 177 Cardinals have an inverted slot on the leading edge of their horizontal tail surfaces to delay the stall when the stick is pulled right back.

Flaps vary from simple hinged surfaces to flap types that descend below the lower wing surfaces and extend rearwards to increase the wing area and provide slots as depicted above to prohibit the flaps stalling. These are called Fowler flaps and excellent details are provided via the internet if one Googles f*owler flap, slotted flap, or jetted flap*. Fowler flaps can make very substantial changes to an aeroplane's slow speed flight profile but come with weight, complexity, and cost penalties.

Again – what does this mean to a pilot? It simply means that the aeroplane fitted with one or more of these high lift devices can fly in level flight at a lower speed. But don't be complacent – any aeroplane can and will stall, and will do so at any airspeed if the angle of attack exceeds the stalling angle of attack.

However, there are other things that can change the stall speed. I refer to changing aeroplane weight. Not only does this include additional weight at take-off, but also loading, the apparent increase in weight when the aeroplane turns or pitches. The greater the turn rate or rate of pull up from a dive, the greater will be the lift required from the wings so the greater will be the stall speed. Flying the aeroplane with slip or skid will cause shielding of part of one of the wings and this, too will provide a raised stalling speed. Imagine the scenario – set up on approach, descending through 600 feet AGL, turning from left base onto finals, a bit much into-turn rudder to pull the nose around and pulling a bit of G. There is a sudden buffet. What's that you wonder? Then, before you can answer your own question the port wing just falls out of the sky. The aeroplane has rolled in a fraction of a second and now the nose is pointing vertically down. The left wing is still dropping – the world rotates in front of the windscreen with the nose so low all you can do is pull back on the stick to try and pull it up but it's not moving. The world is rotating even faster and the trees and buildings on the ground are screaming up to you……

Next month we will be looking at what happens to the aeroplane, its potential; movement and direction of motion changes at and post stall.

Happy Flying

SCHOOL FOR WARBIRDS
Photos and text by Budd Davisson

Learning to Fly the Mustang was Just Part of Junior Burchinal's Academy of Higher Learning

Air Progress, July 1971

CHECKING OUT IN THE P-51 MUSTANG

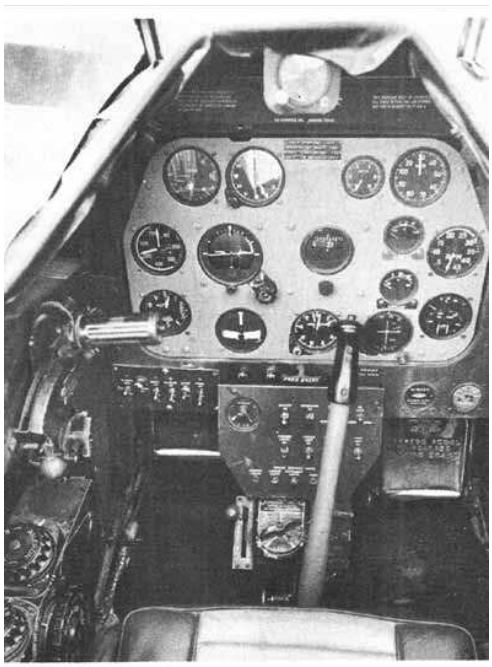
His airplanes may have not been prize winners but Junior flew them constantly.

Here I am again at the Flying Tiger Air Museum in Paris, Texas, hiding in the back of a North American SNJ-5, for my second session of Junior Burchinal's how-to-be-a-fighter-pilot course. If things went according to schedule, I would get another couple of hops in the SNJ and then get ready to have a go at the P-51 Mustang. Just thinking about tangling with a 1,450hp, full-fledged fighter, after the trouble I'd had with a 600-hp trainer, made my knees turn to silly-putty. I've dreamed my entire life about flying a Mustang, and now that I was close, I wasn't sure whether it was a dream or a nightmare.

Luckily, my first landing in the SNJ after a month's lay-off was a no-flap wheely in a crosswind, and I pasted it on with nary a wiggle. In the past, when the tail came down during the roll-out in a wheel landing, it would try to swerve, but this time I was ahead of it, nailing the rudder as needed

For some miraculous reason, all my troubles of a month ago disappeared, and the SNJ became just another airplane with a few oddball characteristics all its own. I even managed to make some decent three-points in a hard left crosswind. Junior decided to put me into the Mustang to taxi around some more and feel out its ground handling. I carefully (very carefully) added enough power to get it rolling and then found I couldn't pull back on the power hard enough to keep it from accelerating. Even at idle power that four-bladed prop out front wanted to drag me around at 50 mph, if I'd let it. It took little stabs of brake every so often to keep it from accelerating.

The tailwheel lock is controlled by the stick. With the stick in any position except full forward, the tailwheel steers about six degrees either direction, plenty for taxiways and takeoffs and landings. Push the stick hard forward and you can feel it pull the locking pin out of the tailwheel mechanism allowing it to full swivel. With the stick back, the Mustang steers not unlike a Citabria with weak tail wheel/rudder springs.



The front, and only, office of a P-51D. All the engine start stuff and the fuel selector is on the panel between your legs. The trim wheels are under your left elbow

It's extremely easy to control and an absolute delight after dashing from rudder to rudder on the SNJ to keep from ending up in a ditch. The only trick is remembering to unlock the tailwheel while it's still rolling perfectly straight. If you are in even the slightest turn and try to unlock it, it won't go; the tailwheel will hop sideways, possibly damaging the tail post.

The cockpit layout is not only well thought out, but is almost a duplicate of the SNJ. The left console under your arm has the flaps at the extreme rear. They're set in notches of about 10 degrees apiece up to 50 degrees. It takes a bit of twisting to get your arm back there, but there is no mistaking it for the gear handle.

The top of the left console has the rudder and aileron trim knobs and the alternate air source levers. The handbook says to use 6 degrees right rudder trim for takeoff, which was an ominous warning if I ever saw one. The elevator trim is at the left edge of the seat and the gear handle is down by your left foot. You have to pull it in and then up, and there are no weight-actuated down-locks to prevent you from accidentally bringing the gear up on the ground, so you treat that handle with respect.

The throttle is a Luger-like grip affair. Just inboard of the throttle is the prop pitch control and on the very back of the quadrant, moving up and down, is the mixture control.

The handbook is full of detailed operating data and fills you with despair of ever figuring out all the systems, but once in the airplane, everything seems entirely normal and logical-except for the airspeed and manifold pressure gauges. The airspeed goes up to the astronomical number of 600 mph and the top of the green arc on the manifold pressure is 61 inches! My eyes could hardly focus on those numbers!

Burchinal's Mustang is a P-51 D and is painted in the colours of Col. J.J. Christiansen of the 479th Fighter Group, 455th Fighter Squadron, Eighth Air Force, European Theatre of Operations. Christiansen and his Louie IV were shot down over France in 1944, but they are well remembered. No chronicle of the Mustang is ever complete without at least one picture of the colourful Louie IV.

One of the additional advantages of flying with junior Burchinal is that you are bound to be personally involved in some of the never-ending maintenance that warbirds need. This is especially important to the guy who intends to buy one and it is interesting to any red-blooded warbird nut.

Besides learning how to service the Mustang, checking coolant, oil, leaks, and so forth, junior fills you in on all the little details that are nice to know if you want to operate a warbird.

As it was bound to, the big day finally arrived. Today I was going to launch in the Mustang. Since there's only one set of controls in the Mustang, you only get one go at it, and it had better be good. All that Junior can do is explain procedures thoroughly and have you ride around in the back for a while getting a feel of it, and then let you go. He put me in the back and we went out to see how the aircraft does certain things. We did stalls and torque rolls, none of which really helped me because I was just a passenger and I couldn't appreciate what was necessary to keep things under control. He did impress me by slowing to 100 mph and adding power until he was out of right rudder and the airplane was still slewing left. The Mustang has a power-on Vmc just like a twin-engine airplane, but it only has one engine. With a lot of power, it takes speed to make the rudder effective enough to overcome torque and P-factor.

We headed for Cox Field, Burchinal's practice airport, and I knew things were getting close. He shot a couple of landings with me perched on his shoulder like a gremlin, trying to learn as much as I could second hand. He even had me reach around him and make turns with ailerons only so that control effectiveness wouldn't come as a surprise when I made my first flight. He talked to me-correction, yelled to me-all the way through his approaches trying to tell me what was happening. He flew the approaches exactly as we had in the SNJ except that the numbers were much faster.

Then it happened. He pulled over to the side, climbed out, and said go fly it—just as if he were soloing a kid in a Cherokee. He said something about me doing fine, but I couldn't be sure because my heartbeat drowned him and the Merlin out completely. Actually, I was quite calm, all things considered. We had talked, and trained, and flown, aiming everything at this moment, and I felt prepared.

The Mustang taxied easily into position, squarely between the two white centre-lines. Prop forward, flaps up, boost on, tank on right. A thousand hangar tales raced through my mind at one time—maybe I was a little scared. Torque rolls, screaming swerves, 1,450 horsepower. I once again noticed where the horizon split the spinner for future reference, and started moving the throttle slowly forward. I really didn't mean to start the takeoff roll, but I couldn't think of anything else to check. I was out of excuses and eager to fly.

Visibility was excellent and I began feeding power in more rapidly because I was eating up runway like crazy. More left arm, more power, more noise. Anything you hear about a Mustang's cockpit noise can be believed. It ceased to be sound and became a pressure, forcing against my eardrums. My right foot nervously twitched at the right rudder, coiled, wired, positively aching to trounce the rudder to the floor the minute the long skinny snoot started swerving, as I knew it must. Thirty inches, thirty-five inches, forty inches. My right arm tired of trying to hold the tail on the ground. It was going to come up despite anything I could do, so I neutralized the stick and the tail blew off the ground.

As the nose levelled out, howling its way toward the other end of the runway, it was suddenly as if I were standing up in the airplane; the visibility was tremendous. My eyes darted back and forth from one side to the next, keeping the long line of Dzus fasteners in the centre of the cowl lined up with the expansion joints in the pavement.

At 45 inches, it suddenly felt as if it were dragging me forward and I was being rammed toward the tail, a helpless passenger strapped to a cannon ball that was going to pull me through space. Noise, noise, noise! At 50 inches, 55 inches, my foot still pressed lightly, but firmly on the right rudder.

When was I going to get the chance to play Mustang driver and fight to keep the nose straight, mashing the rudder to the floor, using brake when the rudder was gone? When was the torque going to become the uncontrollable genie all the big guys talk about? Suddenly, it was off the ground. I'm flying a P-51! Whooee! They could hear me in the next county.

Back to business. By the time I was off the ground and had a chance to check the airspeed, I was already passing through 140 mph. The program called for me to stay in the pattern for the first flight, leaving the gear down. On the next flight, I would clean it up and go out into the area to hunt FWs. Bringing the power back to Burchinal's supereconomy climb settings of 29 inches and 1850 rpm, I held 130 mph and banked easily left onto crosswind. At this low speed the controls are extremely light, maybe even a little soft. Even though I was terribly slow, the airplane felt extremely solid and comfortable-and so strangely familiar.

I was sitting on top of the world-in my own private little bubble. In level flight on downwind, visibility was totally unrestricted, but things were getting a little busy for sight-seeing. Flying an aircraft with a wing loading of over 45 pounds per square foot and a general reputation of gliding like a cast-iron frisbee, I was really afraid to reduce power. I considered leaving 30 inches on and driving it onto the ground, but I knew that the second I lowered the nose I'd be charging around at 200 mph. The Burchinal Method is three-point or forget it, so I figured I'd stay with the program and have at it. The airspeed showed 130 mph when I ran my 35th GUMP check.

I gingerly brought the power back a bit, and reached back with my left hand to shove the flaps down two notches. The nose tried to pitch down, but the stick forces are so light that my right hand automatically came back, maintaining an attitude that came out as 130 mph while I rolled in enough trim to hold it. I kept an anxious vigil - airspeed, manifold pressure, altitude. I was still carrying about 20 inches when I turned base and slowed to 120 mph. I kept waiting. When was the bottom going to fall out like a real fighter? So far it had acted like a lady, flying as if it were on rails. Roll out on final, twisting my arm again to grab the rest of the flaps.

Oh, oh, here it comes. I rolled a little up trim and jumped up to the throttle as we sink just a little low. I figured I had to catch it or it would fall to the ground like the proverbial rock. I was afraid of the throttle. It's a dynamite plunger that all the books say will roll you on your back if you even touch it. But I was low and I had to add power. I eased the throttle forward, intending to keep my arm moving as fast as necessary to keep from bouncing off the Texas landscape, right leg ready to jump. The left hand started moving and the sink stopped just as quickly. What's this? It flies on final just like an airplane.

Well, the ground was coming up and the worst was probably yet to come.

Burch said 100 to 110 over the fence, so the power came back a little more and the stick did the same. While I was doing this, I suddenly realized I could see the runway right over the nose! Even a Citabria is blinder than that! The numbers disappeared; I had it made. The power was all the way back, and the Merlin barked in protest. As the runway came up to meet me, it didn't seem a bit different from the SNJ, except I could see what's going on. I leveled out what I figured to be a foot or so up and the airplane surprised me by actually floating. Here I was in a solid brick of aluminum and it had a bit of float to it.As it tried to settle, I brought the stick back until the horizon split the nose exactly where it had when I sat in it all those hours logging cockpit time. I was in a three-point attitude; all I could do now was wait until I hit the runway. Just as on every approach in the SNJ, I moved my feet up to get better leverage on the brakes and got ready to kick. A slight bump, two

from the tail as the tailwheel skipped, and we were down and rolling straight, me and the Mustang. Was that it? Wasn't it going to careen down the runway, letting me live up to the superpilot image?

With the stick in my lap, that steerable tailwheel made the rollout almost Cherokee simple. One thing is certain: the P-51 doesn't want to stop running. Even on the ground, it gives up speed very grudgingly. I pulled on the throttle several times to satisfy myself that I wasn't carrying just a little power. I was in no real hurry to stop, so I just let it roll, using very little brake at the far end of the 5,000-foot runway to make the turnoff.

While still rolling straight, I pushed the stick hard forward, unlocking the tailwheel. Once on the taxiway, I reached back and brought the flaps up and rolled the canopy open. Rolled the canopy open! I couldn't believe it! For a lifetime I had dreamed of it, and now I had done it. I had soloed a Mustang!

I went back and made several more gear-down circuits of the field, none of the landings being as good or as satisfying as that first one. Then Junior told me to clean it up and go play with the Messerschmitts.

Tidying up the cockpit after that first takeoff, I found I had forgotten to use the recommended 6 degrees right rudder trim, but I had applied power so slowly that the torque/P-factor buildup had been negligible. In subsequent takeoffs, I started moving the throttle faster and faster, trying to see at what point things would become scary.

I must admit that I wasn't really aware of what was happening on that first takeoff, so I started noticing more and more things as I experimented. For instance, I found that I didn't have to rush the power very much before my right foot became very useful. Also, at around 40 inches there was a definite change in sound and torque, something like a governor surge that increased the acceleration and usually swung the nose left. It was easily corrected, however. Actually, it looks as if you'd have to either let the hammer down fairly fast and hard, or hoist the tail too soon, or both, to get into completely uncontrollable trouble. The airplane will fly itself off at almost any power setting. I took off once at 40 to 45 inches, so there are plenty of ways to keep yourself out of trouble, providing you're trained right and are treating the craft like the fighter it is.

With 50 to 55 inches for takeoff, the airplane seemed to accelerate almost immediately to 140 mph and then jumped to 200 mph when I brought the gear up. I had always wondered how a Mustang gear handle felt when you moved it, and now I know—it requires almost no pressure to pull in and up. Burchinal climbs and cruises all his airplanes and his pick-up truck at 29 inches and 1850 rpm to keep gas consumption down. When I used this power setting and a climb speed of 175 mph I was showing only about 1,500 fpm rate of climb. I knew Mustangs were supposed to climb better than that, so I played with power settings up to around 35 inches, where I got a solid 2,200 fpm. Junior had cautioned me to stay below 35 inches because anything higher was starting to work the engine too hard.

In the climbs, the nose covers everything ahead, so I S-turned constantly to make sure I didn't slice into a Cessna or something. It took a while to get used to the fact that I was climbing at 175 mph indicated, which was faster than the top speeds of most of the aircraft I normally fly. I kept climbing because I wanted all the air I could get between Texas and me, when I started playing.

Levelling off at 7,000 feet, I let the airspeed build and set up the traditional 29/1850 power combination. As the speed came up, I had to use more and more forward trim to keep from gaining

altitude. When the airspeed indicator finally stabilized, it showed about 240 mph, which was almost 260 true, and I was at a power setting so low it wasn't even on the power charts. Again, I played with different power settings up to 35 inches and got up to 265 IAS in level flight, which is around 305 mph true! I had to constantly keep looking around to keep my bearings because the towns in Texas seemed to be rather close together at that kind of speed.

As speeds go up, so do control pressures, but they never get heavy. They always stay on the stiffish, but very effective, side. It's an intoxicating feeling to look around, feeling nearly naked because of the bubble canopy, monitoring airspeeds most of us never see, and looking down at my right hand with the trigger under the index finger. I've played fighter pilot plenty of times in homebuilts, Swifts, Zlins, and other spiffy little airplanes, but this time I wasn't playing. When I moved the stick, it was a Mustang that responded, not a Swift. When I dropped the nose and the speed leaped up to 300 IAS, that was mph, not kilometers as in the Zlin.

Junior had positively forbid my doing any aerobatics until I had more time in the airplane—a frustrating, but smart piece of advice. So, I had to satisfy myself with screaming, cheeksagging turns and whatever else I could think of that couldn't be called aerobatics. It was really fun to drop the nose just a little, get 300 on the gauge and pull up into a chandelle that would gain as much as 3,000 feet before I'd level out at 125 mph.

After I felt that I could control the airplane and I knew how it flew, I decided to find out how it didn't fly—I was going to stall it. Somehow, just the idea of stalling a Mustang was scary. I had plenty of altitude, and she had proven capable of being tamed so I went ahead and did the pilot report thing. I decided to do power—off straight-ahead stalls first, with nothing hanging out, no gear or flaps. I brought the power back and pulled the nose up slowly. Just in the process of slowing down, I picked up 1,000 feet! Down to 130, 115, 105.

Suddenly, as 100 mph came up, I was looking nearly straight down at Texas, in a diving left hand turn. The nose attitude wasn't as steep as it had first appeared, but there was no warning other than a slight looseness of the controls. The stall broke, dropped the left wing, and pointed the nose down, almost as fast as I could think about it. I was careful to add power smoothly and pulled out after dropping less than 1,500 feet. With a little practice, I found I could stall it and add just enough power to gain speed and altitude, but not introduce torque problems and keep the altitude loss to around 600 feet or even less.

As I dirtied up the airplane, the stall speed came down and it began to give a little warning. With everything hanging out, the stall still broke fairly cleanly and rolled left, but there was a little buffeting and a definite sloppiness to the elevator. At all slow flight speeds, right up to stall, the airplane was completely stable and easy to control. Even though the controls were a little soft, they were effective, and the airplane felt fine at almost any speed. It looked as if I could make a go-round at 30-35 inches and 100 mph.

I dived and swooped and twisted and turned, and it was all I could do to keep it right side up. It just seemed to whisper in my ear, "Go ahead, roll me," but junior had his reasons for prohibiting aerobatics and I knew I had heard the siren call of the Mustang. I could see that this airplane could easily install false confidence in the inexperienced pilot, such as myself, and he could get himself into serious trouble. Knowing I could resist the siren call only so long, I decided to take junior's plaything home before I backed myself into a corner. Besides, I hadn't seen a single FW-190.

I was at 6,000 feet and I thought I'd never get that thing down from altitude. At 175 mph it has a glide ratio of nearly 15:1; it will glide three miles for every thousand feet of altitude. I tried dropping

the nose and diving down at 250 mph, but then found when I got to the altitude I wanted, the airplane didn't want to slow down, and I'd gain altitude trying to bring the nose up. So, this is what a high-performance airplane is like. The Mustang is so slippery, that you really have to work to get it down to 200 mph. Under 200 mph, it's fairly easy to control the speed, but above 200, even the slightest jerk on the stick picks up 500 feet and may not even budge the airspeed. I made lots and lots of circles getting down to pattern altitude.

As soon as I had 170 mph and pattern altitude, I dropped the gear so that it would be easier to slow down. The gears falls into place with a very audible and easily felt "clunk, clunk." Even if the gear hydraulic system failed, I could let it free fall into place by pulling the hydraulic release handle on the lower panel.

Once down to 150 mph, the landing was just a repeat performance of the last ones, except it was a little crosswind and I was a little too fast. I didn't kill the power soon enough and came over the fence at around 115 mph, which was too fast. I was floating like a Taylorcraft and I couldn't get into the three-point position without ballooning, so I wheel-landed it and got on the brakes.

On the main gear, it's dead stable, although you feel as if you pick up 20 mph when you hit because it doesn't slow down at all. The tail is heavy enough that you can drop it early if you want, which I did, and depend on the tailwheel steering. Even though I was fast, it still slowed fast enough that 5,000 feet was plenty of runway. Now, if I'd wanted to make the middle intersection, I might have been in trouble.

So, now I've done it. I've flown a Mustang in all regimes of flight and played fighter pilot as much as I dare. What are my initial impressions? I have to be careful what I say because I was probably about as well trained as neophyte civilian types get before they fly Mustangs. I had 10 hours of fairly concentrated SNJ work and hours and hours of talking and studying, not to mention additional hours sitting in the cockpit, learning the airplane.

What are my impressions? Surprise, relief, exhilaration, and even disappointment. I was surprised at how easy and how stable the airplane was. It was a relief after battling; with the SNJ. The airplane is exhilarating in every phase of its performance and is still docile enough that with sufficient training it is entirely safe. Disappointment? Yes, maybe a little, because the Mustang wasn't nearly the killer I had expected and read about, and I know that even though I now belong to a fairly elite group, I know deep inside that it was nothing but opportunity that put me in that group, not talent.

The Mustang was built to be flown by well-trained 200-hour pilots. I repeat, well trained, and if a pilot gets that same sort of training, the Mustang will be a piece of cake. On the other hand, if you approach the Mustang figuring you can whip it because you have thousands of hours in Bonanzas and the like, it'll chase you all over the airport. The P-51 has characteristics that nothing in civilian aviation can prepare you for.

A military airplane is a military airplane, and it takes a certain amount of military type training in an SNJ or T-6 to make you safe enough to fly it. Although I'm competent enough in almost all civilian tailwheel types, that 10 hours in the SNJ is probably the best insurance for flying warbirds.

Want to fly a fighter? Going to buy a fighter? Used to fly them and want another go at them? Whatever your reasons, whatever your desires, the Flying Tigers Air Museum is the place to go. I don't know of another place in the world where you can plunk down your piggybank and be trained to fly this type of airplane-and be trained well. Bearcat, Mustang, Corsair, Lightning, Mitchell—take your pick.

Editor's note (at time of writing (1971)): 'Told you, didn't I? Can you imagine something like this existing today? Stallion 51 in Kissimmee, Florida is the only place you can go and actually get stick time in a Mustang, but it's a dual-control TF-51D. Their airplanes are nearly perfect specimens of the breed and their training absolutely the highest quality. Still, there was something about the dirt-under-the-fingernails feel of Junior's operation that was, and is attractive.

Looking back I realize his maintenance was such that it was a miracle he never bent an airplane. On the other hand, if you wanted to fly any of his airplanes, you could. No amount of money can buy you that kind of experience anywhere on the planet today. But, at least I've been there and done that and no one can take that away from me.

FLY-INS Looming

Oct 14	Murgon (Angelfield), ALA	Burnett Flyers Breakfast Fly-in
Oct 15	Watts Bridge, YWSG	Watts for Breakfast
Oct 21	Dunwich	Straddie Fly-in and Grand Breakfast

Mystery Aircraft (October Issue)

What's this?

Mystery Aircraft (Last Issue)

Supermarine bomber, B12/36. Prototype only flew because the factory was burned down and, as Mitchell had died, no-one had the expertise to reproduce the material needed to continue with development

Congratulations, again, to Mal McKenzie for identifying this singularly rare aircraft.

Letter from the new President

Hi Fellow Club Member

I would like to introduce myself and provide a brief summary of my flying history

I began my flying passion in 1982 as a member of the Gympie Soaring Club and since those days I have owned and maintained a plethora of Gliders, Motor Gliders and RAA aircraft

I have been a member of QUA and now BVSAC for many years and have been flying in and out of Watts Bridge since the 80's so it seemed appropriate that I put up my hand to take on the presidency of BVSAC. I accepted the position knowing that Richard and the other committee members have done a magnificent job of keeping the club financial over the past years and maintaining a healthy membership

The future looks great for the club and I look forward to meeting with all of the club members over the next few months

My passion for flying takes me to the field most Saturdays and occasionally midweek Wednesdays so you can meet me there or, If you would like to get in touch email me at president.bvsac@gmail.com or call me 0424958173

Kind regards

Sandy Walker

Last month saw the AGM and with it came a new set of committee members. Complete with contact numbers, the new list includes:

Committee Contacts

Sandy Walker	President	0424-958-173
Peter Ratcliffe	Vice President	0418-159-429
Peter Biddle	Secretary	0402-403-469
Priscilla Smith	Treasurer	3206-3548
Peter Ratcliffe	WBMA Delegate	0418-159-429
Rob Knight	Editor Brisbane Valley Flyer	0400-893-632

Keeping up with the Play (Test yourself – how good are you, really?)

1. What does 10 litres of petrol weigh?
   A. 10 kg
   B. 7.2 kg.
   C. 12.8 kg.
   D. 14.4 kg.

2. Which of the following are the classic symptoms of carburetor icing on an engine in flight?
   A. A sudden and substantial drop in engine power.
   B. A fall in engine temps (caused by the ice) and a drop in RPM.
   C. A richened mixture causing a drop in engine power.
   D. A drop in RPM and rough running.

3. Which of the following are the required conditions for Cbs to form?
   A. Atmospheric instability extending through at least 10,000 feet.
   B. A relatively moist atmosphere, especially aloft
   C. A trigger to start an uplift action.
   D. All the above are correct.

4. Propeller blades appear to have a longitudinal twist along their blades. This twist
   A. Is an optical illusion.
   B. Is to minimise thrust losses near the propeller boss.
   C. To improve thrust at the propeller tips.
   D. To maintain a constant angle of attack along the span of the blade.

5. A minute of latitude is:
   A. The same as a minute of longitude.
   B. 1 degree of longitude
   C. 1 nautical mile.
   D. 60 degrees of latitude.

ANSWERS: 1. B, 2. D, 3. D, 4. D, 5. C

If you have any problems with these questions, call me(in the evening) and let's discuss it! Ed.

BRISBANE VALLEY SPORT AVIATION CLUB Inc

MINUTES OF THE SEPTEMBER 2017 GENERAL MEETING

MEETING LOCATION: Watts Bridge Memorial Airfield – BVSAC Clubrooms

MEETING DATE: 2 September 2017

MEETING OPENED: 1050hrs

MEMBERS PRESENT: 13

APOLOGIES: Ian Ratcliffe, Peter Ratcliffe, David Ratcliffe, Liz Cook, Ken Hulse, Glenda Faint, Mark Purdie.

VISITORS: Peter Mullen

NEW MEMBERS: Dale Meyer

MINUTES:

August meeting of the BVSAC Inc. - Proposed: Peter Biddle. Seconded: Vern Grayson. Acceptance motion carried.

BUSINESS ARISING:

- Nil

PRESIDENT'S REPORT:

Sandy Walker as the new president thanked the outgoing Richard Faint as the outgoing president for his work to support the club over the last 12 months.

SECRETARY'S REPORT:

Correspondence in

Date	From	Subject
06/08/17	Watts Bridge BoM	Invoice for lease payment
14/08/17	Watts Bridge BoM	July BoM minutes
15/08/17	Watts Bridge BoM	Warwick flyin/breakfast on 9/9/17

Correspondence out

Date	From	Subject
07/08/17	Secretary	Notification of AGM
30/08/17	Secretary	Letters/cheques re loan repayments

TREASURER'S REPORT:

The President read the Treasurers report for August 2017.

- BVSAC ING account - $568.62
- BVSAC NAB account - $10,204.89

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WATTS BRIDGE REPORT

Peter Freeman advised

- A number of holes have been filled on the 12L/30R runway
- The new gate 8 from the 03/21 runway into the commercial hangar area is open.
- Not known when the 12R/30L runway will be closed for maintenance.

Reminder that contra circuits are in place on the 12/30 runways. Refer ERSA.

GENERAL BUSINESS:

Sandy Walker –SAAA from Caboolture will be visiting next Saturday (9/9/17) for lunch. Would be good to have as many members as possible on site. Lunch from midday onwards.

Mike Smith – led discussion on the questions in the September Newsletter

NEXT MEETING: The next meeting will be on Saturday 7 October 2017 in the BVSAC Clubrooms at Watts Bridge immediately following the Annual General Meeting. A BBQ lunch will follow the meeting.

MEETING CLOSED: There being no further business, the meeting was declared closed at 1130 hrs.

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HANGARAGE

A single place hangarage space is available at Forest Hill airfield (YFRH). The airfield gate and hangar are both kept locked to all except key-holders.

Contact Rob Knight on 0400 89 3632

¼ Share for sale - $4500
A share in a WB Drifter 582 is being offered. The aircraft is based at Lynfield west of Brisbane.
¼ share price of $4500 (includes hangarage
Contact Kev Walters Tel 0488 488 104

Aircraft for Sale - SLING

Year of build. 2016. Hobbs meter shows 53.2 hours but exact engine hours I will have to check as it is currently being flown. Complete with factory drawings and a large number of photos showing various stages of completion.

Cruising at 5450 RPM gives 108 knots, burning 18 litres per hour. With a total fuel tank capacity of 150 Litres (75 Litres per side) it has a maximum range of 900 nm.

The aeroplane is currently hangared at Gatton Air park

I also have a significant quantity of clecos for sale.

$115,000 (neg)

Call Geoff Scott on 0435 248 483

Aircraft Offered for Reluctant Sale

A Colby-503, a single-seat, one-off aircraft, based on the highly successful American Pioneer Flightstar. Currently flying most weekends, it has around 200 hours airframe total time and under 30 hours on a rebuilt Rotax 503 power plant. STOL, this aircraft cruises at anything between 45 and 60 knots, depending on the power setting and can comfortably exceed its VNE in a climb. It holds 40 litres in a belly tank and a further 10 behind the seat. A 95-10 aircraft, its rego is 10-1918, valid until July 30 2018.
A sale would include a purpose-built trailer (uncovered and unregistered), a spare 503 engine (disassembled), and a ground handling tow bar. There are some other assorted spare parts such as a strut, control surface tubing, fuel pump, spark plugs etc.
I currently use a hand-held radio mounted in the cockpit with a head set and PPT fitted on the side-mounted stick.

I am putting my aeroplane up for sale only on the advice of my health professional.

$5,800.00

So, if you fancy owning and flying a totally unique aircraft, the ONLY one of its type in the world, contact Rob Knight, on 0400 89 3632, or email me at kni.rob@bigpond.com.